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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/804,721	03/19/2004	John A. McClure	4009	7501

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EXAMINER	
BROADHEAD, BRIAN J	
ART UNIT	PAPER NUMBER
3664	

MAIL DATE	DELIVERY MODE
11/08/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/804,721	MCCLURE ET AL.	
	Examiner	Art Unit	
	Brian J. Broadhead	3661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *20 July 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12, 14, 17-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12, 14, 17-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The declaration under 37 CFR 1.132 filed 7-20-07 is sufficient to overcome the rejection of claims 1-12, 14, and 17-21 based upon McClure et al., 6539303.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 7-20-07 has been entered.

Claim Objections

3. Claim 18 is objected to because of the following informalities: It is dependent on a cancelled claim. Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-12, 14, and 17-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Claim 1 recites the limitation "said desired track" in line 16. There is insufficient antecedent basis for this limitation in the claim.

7. Claim 11 recites the limitation "said desired line" in line 2. There is insufficient antecedent basis for this limitation in the claim.

8. Claim 19 recites the limitation "said desired track" in line 18. There is insufficient antecedent basis for this limitation in the claim.

9. Claim 20 recites the limitation "said desired track" in line 17. There is insufficient antecedent basis for this limitation in the claim.

10. Claim 21 recites the limitation "said desired track" in 18. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. Claims 1-3, 5, 8-10, 17-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Sampo et al., 5923270.

13. As per claims 1, and 19-21, Sampo et al. disclose receiving global positioning system (GPS) data including position and velocity information corresponding to at least one of a position, velocity, and course of said vehicle on line 60, on col. 3 through line 5, col. 4; receiving a yaw rate signal corresponding to a yaw rate of the vehicle on lines 32-40, on column 3; computing a compensated heading for said vehicle based on an integration of said yaw rate signal, said compensated heading comprising a blend of said yaw rate signal with heading information based on said GPS data, wherein said

compensated heading is further dynamically calibrated based on said GPS data on lines 48-60, on column 3; computing an actual track and a cross track error from said desired swath based on said compensated heading and said position, wherein said position is compared with a selected desired position of said plurality of desired positions and said compensated heading is compared with a selected desired heading of said plurality of desired headings on lines 58-67, on column 5 and lines 35-45, on column 6; , calculating a desired radius of curvature to arrive at said desired track with a desired heading, and generating a steering command based on said desired radius of curvature to a steering mechanism, said steering mechanism configured to direct said vehicle on lines 1-36, on column 7.

14. As per claims 2, 3, 5, 8, 9, and 10, Sampo et al. disclose receiving differential corrections for said GPS data and correcting said GPS data based on said differential corrections, said GPS data includes at least one of carrier phase RTK corrections, a satellite based differential corrections, and ground based differential corrections on lines 61-63, on column 3; generating a differential corrector with a reference DGPS receiver and transmitting said differential corrector to the vehicle on lines 61-63, on column 3; reducing errors in an along track velocity and position by rotating an east and north velocity from the GPS data into and along track and cross track components using the compensated heading in lines 61-63, on column 3 (this is just claiming the basic operation that is part of using GPS data for error correction); said calculating includes generating radius of curvature data, based on best fit algorithms from said GPS data including a current position, a heading and a speed to a desired aim point and desired

heading, said aim point can be at least one of: on a straight line with parallel guidance; an interpolated point from a point of closest approach to a previously logged, stored or generated curved track; an edge of previously traveled swaths; a data file of track points based on best fit algorithms on lines 1-35, on column 7; said generating a steering command includes generating a command to drive a hydraulic or electrically driven steering system of said vehicle based on a difference between said desired curvature to reach an aim point, a current speed of said vehicle and a rate of turn of said vehicle on lines 5-18, on column 3.

15. As per claims 17 and 18, Sampo et al. disclose said blend includes combination of said yaw rate signal with said heading information, said yaw rate signal exhibiting high short term accuracy relative to said heading information, while said heading information exhibits high long term accuracy relative to said yaw rate signal on lines 50-60, on column 3; and said blend employs Kalman filtering techniques on lines 15-16, on column 4.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sampo et al., 5923270, in view of O Connor et al., 6643576.

3. Sampo et al. disclose the limitations as set forth above. They do not disclose utilizing a DGPS system with dual antennae optimized to generate additional accuracy in said GPS data, further including heading data and generating said compensated heading utilizing said GPS data and said heading data. O Connor et al. teach utilizing a DGPS system with dual antennae optimized to generate additional accuracy in said GPS data, further including heading data and generating said compensated heading utilizing said GPS data and said heading data on lines 12-15, on column 3. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the dual antennas of O Connor in the invention of Sampo et al. because such modification would provide more accurate positioning data.

4. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sampo et al., 5923270, in view of Perlmutter et al., 6622091.

5. Sampo et al. disclose the limitations as set forth above. They do not disclose said dynamic calibration includes at least one of rate gyro bias error and scale factor error, during operation, and eliminates static initialization. Perlmutter et al. teach said dynamic calibration includes at least one of rate gyro bias error and scale factor error, during operation, and eliminates static initialization throughout the disclosure. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the initialization of Perlmutter in the invention of Sampo et al. because such modification would be necessary to remove errors from the gyro of Sampo et al. Error correction is known and considered necessary with gyroscopic sensors.

6. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sampo et al., 5923270, in view of Staub et al., 6236916.

7. Sampo et al. disclose the limitations as set forth above. They do not disclose generating a tilt angle for said vehicle based on at least one of a filtered accelerometer signal and roll signal which can be used to generate a cross track correction based on antenna rotation height to correct for slope induced error in said cross track error. Staub et al. teach generating a tilt angle for said vehicle based on at least one of a filtered accelerometer signal and roll signal which can be used to generate a cross track correction based on antenna rotation height to correct for slope induced error in said cross track error on lines 66-67, on column 1, and lines 24-31, on column 4. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the tilt sensor of Staub in the invention of Sampo et al. because such modification would correct for errors in position because of the roll. It is obvious to one of ordinary skill in the art that inclination of a vehicle will throw off the position determination since the antennas are at the top of the vehicle for best clear sky access.

8. Claims 11, 12, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sampo et al., 5923270, in view of Keller et al., 6463374.

9. Sampo et al. disclose the limitations as set forth above. They do not disclose offsetting said desired line to match differences in spacing of existing tracks to compensate for spacing errors therein; compensating for features in fields with a step in a nominal spacing of parallel guidance lines by offsetting said desired line to align with a current position; real time determination of slope at a current position and application of

a swath width adjustment to optimize real ground coverage to yield correct spacing between swaths and additional ground coverage on lines 8-20, on column 2, and lines 32-47, on column 10. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the teachings of Keller in the invention of Sampo because such modification would result in the accommodation of terrain features.

Response to Arguments

10. Applicant's arguments with respect to claims 1-12, 14, and 17-21 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian J. Broadhead whose telephone number is 571-272-6957. The examiner can normally be reached on Tuesday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Black can be reached on 571-272-6956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Brian J. Broadhead
Examiner
Art Unit 3661